

IN THE CLAIMS:

Please add new claims 179-200 as set forth below. A complete listing of the claims and their status follows. This listing replaces and supercedes all prior claim listings.

Claims 1-97 (cancelled)

98. (previously added) A method for distracting in a given direction two tissue surfaces comprising consecutively introducing a plurality of elements in contact with each other between the tissue surfaces to distract such tissue surfaces generally in the given direction as elements are consecutively introduced.

99. (previously added) The method of claim 98 wherein said elements are introduced by moving at least one element to a different position upon introduction of a subsequent element.

100. (previously added) The method of claim 99 wherein said at least one element is moved by contacting a surface thereof with a surface of said subsequent element.

101. (previously added) The method of claim 100 wherein the introducing step includes the step of placing an elongated access channel in communication with a space between said tissue surfaces and introducing the elements through said channel.

102. (previously added) The method of claim 101, further including the step of providing a bone filler in contact with the elements.

103. (previously added) The method of claim 100 wherein said elements are wafers, said wafers being introduced between said tissue surfaces by stacking one wafer atop another wafer.

104. (previously added) The method of claim 98, wherein said elements are introduced by sliding one element along a surface of another element.

105. (previously added) The method of claim 98, further including the step of providing an outer member and introducing said elements into said member.

106. (previously added) The method of claim 98, wherein said elements have arcuate contact surfaces.

107. (previously added) The method of claim 98, wherein said elements have generally flat contact surfaces.

108. (previously added) The method of claim 98, wherein said tissue surfaces are superior and inferior surfaces of a damaged or diseased vertebral body in a spine, and wherein the elements are consecutively inserted into the vertebral body to distract said superior and inferior surfaces until the normal height of the vertebral body is substantially attained.

109. (previously added) The method of claim 98, wherein said tissue surfaces are superior and inferior endplate surfaces of opposing vertebral bodies in a spine, and wherein the elements are consecutively inserted between said vertebral bodies to distract said opposing superior and inferior endplate surfaces until stability of the vertebral bodies is substantially achieved.

110. (previously added) The method of claim 98, wherein said tissue surfaces are surfaces of a damaged or fractured tibia, and wherein the elements are consecutively inserted between the surfaces to distract such surfaces until the damage or fracture is substantially reduced.

111. (previously added) A method for supporting in a given direction two tissue surfaces comprising consecutively introducing between the tissue surfaces a plurality of elements in contact with each other generally in the given direction until said tissue surfaces are supported.

112. (previously added) The method of claim 111, wherein said elements are wafers configured for stacking one atop another.

113. (previously added) The method of claim 111, wherein said elements are introduced by moving at least one element to a different position in the given direction upon introduction of a subsequent element.

114. (previously added) The method of claim 113, wherein said elements are introduced by sliding one element along a surface of another element.

115. (previously added) The method of claim 111, further comprising the step of introducing a bone filler in contact with said plurality of elements.

116. (previously added) The method of claim 111, wherein said elements are introduced in a manner to simultaneously distract and support said tissue surfaces.

117. (previously added) An apparatus for the support of tissue surfaces in a given direction, comprising a plurality of elements in cooperative contact forming a structure between said tissue surfaces generally extending in the given direction, said elements being configured for consecutive receipt between said tissue surfaces to thereby form said structure as said elements are received.

118. (previously added) The apparatus of claim 117, wherein each element has an interface, the interfaces of elements in contact being configured to provide said cooperative contact.

119. (previously added) The apparatus of claim 118, wherein said interfaces are configured to provide unconstrained degrees of cooperative contact.

120. (previously added) The apparatus of claim 118, wherein said interfaces are configured to provide semi-constrained selective degrees of cooperative contact.

121. (previously added) The apparatus of claim 118, wherein said interfaces are configured to provide constrained degrees of cooperative contact.

122. (previously added) The apparatus of claim 118, wherein said interfaces are arcuate.

123. (previously added) The apparatus of claim 122, wherein said arcuate surfaces are generally cylindrical.

124. (previously added) The apparatus of claim 122, wherein said arcuate surfaces are generally spherical.

125. (previously added) The apparatus of claim 118, wherein said interfaces are generally flat.

126. (previously added) The apparatus of claim 125, wherein said structure is defined by a plurality of wafers each having said generally flat interfaces, one wafer being disposed atop another wafer to form said structure.

127. (previously added) The apparatus of claim 117, wherein said tissue surfaces are superior and inferior surfaces of a damaged or diseased vertebral body in a spine, and wherein said elements are configured for consecutive receipt into said vertebral body to form said structure between said superior and inferior surfaces of said vertebral body.

128. (previously added) The apparatus of claim 117, wherein said tissue surfaces are superior and inferior endplate surfaces of opposing vertebral bodies in a spine, and wherein said elements are configured for consecutive receipt between said vertebral bodies to form said structure between said superior and inferior endplate surfaces of said opposing vertebral bodies.

129. (previously added) The apparatus of claim 117, wherein said tissue surfaces are surfaces of a damaged or fractured tibia, and wherein said elements are configured for consecutive receipt between said surfaces to form said column between such surfaces.

130. (previously added) An apparatus for the distraction and support of tissue surfaces in a given direction, comprising a plurality of stackable wafers cooperatively forming a

column generally in the given direction between said tissue surfaces, the wafers each having a contact surface, a contact surface of one wafer being slidably receivable on a contact surface of another wafer in a sliding direction generally normal to the given direction.

131. (previously added) The apparatus according to claim 130, wherein a stackable wafer comprises a single wafer.

132. (previously added) The apparatus according to claim 130, wherein a stackable wafer comprises multiple wafers.

133. (previously added) The apparatus of claim 130, wherein one or more wafers are curved in a plane generally normal to the direction of the axis of the column.

134. (previously added) The apparatus of claim 130, wherein one or more wafers are of non-uniform thickness.

135. (previously added) The apparatus of claim 130, wherein each wafer has a length and a width and wherein one or more wafers increases in thickness along the wafer length such that the one or more wafers are configured as a wedge.

136. (previously added) The apparatus of claim 130, wherein the wafer contact surfaces are provided with complementary configurations to restrain the wafers from slipping out of the column.

137. (previously added) The apparatus of claim 136, wherein the complementary configurations are complementary ridges and grooves.

138. (previously added) The apparatus of claim 137, wherein the complementary ridges and grooves have dovetail ridge and groove configurations.

139. (previously added) The apparatus of claim 136, wherein the complementary configurations are configured to enable the wafers to rotate in a plane normal to the given direction while remaining in the column.

140. (previously added) The apparatus of claim 136, wherein the complementary configurations comprise detent configurations so configured as to restrain any lateral movement between adjacent wafers in a column.

141. (previously added) The apparatus of claim 136, wherein the complementary configurations comprise a cylindrical indent.

142. (previously added) The apparatus of claim 136, wherein the complementary configurations comprise a spherical indent.

143. (previously added) The apparatus of claim 136, wherein the wafer contact surfaces are configured to permit limited rotation of one wafer with respect to another wafer about an axis parallel to the sliding direction.

144. (previously added) The apparatus of claim 130, wherein the wafers comprise a dovetail and a cylindrical indent to constrain all degrees of freedom.

145. (previously added) The apparatus of claim 130, wherein the wafer contact surfaces have cylindrical interfaces to provide axial translation along the axis of the cylinder and rotational movement about the radius of the cylinder.

146. (previously added) The apparatus of claim 130, wherein the wafers have spherical interfaces.

147. (previously added) The apparatus of claim 130, further including a pin for locking the wafers in place.

148. (previously added) The apparatus of claim 130, wherein each wafer has a leading edge, a trailing edge, and two lateral edges, the wafer further including a lip formed along a bottom surface for limiting axial travel of a subsequent wafer.

149. (previously added) The apparatus of claim 148, wherein the lip extends along all edges of the bottom surface except for the trailing edge.

150. (previously added) The apparatus of claim 148, wherein the lip extends along the leading edge of the bottom surface.

151. (previously added) The apparatus of claim 148, wherein the lip extends along the lateral edges of the bottom surface.

152. (previously added) The apparatus of claim 130, wherein the wafers are marked with a radio-opaque material for observation under fluoroscopy.

153. (previously added) The apparatus of claim 130 wherein each wafer has a length and a width and wherein the wafer defining the bottom wafer in said column has a length larger than at least one other wafer in said column.

154. (previously added) The apparatus of claim 130 wherein each wafer has a length and a width and wherein the wafer defining the top wafer in said column has a length larger than at least one other wafer in said column.

155. (previously added) The apparatus of claim 154 wherein said wafer defining said bottom wafer in said column has a length larger than at least one other wafer in said column.

156. (previously added) The apparatus of claim 130 wherein said wafers comprise implant materials.

157. (previously added) The apparatus of claim 156, wherein one or more wafers have at least one orifice for receiving a filler material therein.

158. (previously added) The apparatus of claim 157, wherein said wafers further comprise osteoinductive agents.

159. (previously added) The apparatus of claim 158, wherein said wafers further comprise a drug therapy.

160. (previously added) The apparatus of claim 130 further including an outer member covering at least a portion of such wafer column.

161. (previously added) The apparatus of claim 160, wherein said outer member is permeable.

162. (previously added) The apparatus of claim 161, wherein said permeable outer member comprises a material of macro-porosity.

163. (previously added) A kit for use in the distraction of tissue surfaces in a given direction, comprising;
a plurality of elements adapted for contact with each other; and
an inserter for consecutively inserting a plurality of elements between said tissue surfaces in a manner such that such elements are placed in contact with each other in a direction generally extending in the given direction.

164. (previously added) The kit of claim 163 further including bone filler.

165. (previously added) A method of treating a damaged or diseased bone having cancellous bone therein having a reduced volume as a result of damage or disease, comprising the steps of:

accessing the cancellous bone within said damaged or diseased bone;
introducing into said cancellous bone an expandable support configured to be expanded within said cancellous bone;
expanding said expandable support unidirectionally within said cancellous bone to restore volume of said damaged or diseased bone;
filling at least a portion of said cancellous bone adjacent said expandable support with a flowable material capable of setting to a harden condition; and
permanently retaining said expandable support within said restored volume bone in said expandable condition.

166. (previously added) The method of claim 165 wherein said expandable support comprises a plurality of elements configured to cooperatively contact each other and wherein said expandable support is expanded by consecutively introducing said elements into contact with each other within said damaged or diseased bone.

167. (previously added) The method of claim 166 wherein said elements are wafers, said wafers being introduced by stacking one wafer atop another wafer.

168. (previously added) The method of claim 166 wherein said elements are introduced by sliding one element along a surface of another element.

169. (previously added) The method of claim 166 wherein said damaged or diseased bone is a vertebral body in a spine, said vertebral body having superior and inferior endplates spaced apart at a height less than the natural height as a result of said damage or disease, said elements being consecutively inserted into said vertebral body to distract said superior and inferior endplates until the normal height of said vertebral body is substantially attained.

170. (previously added) The method of claim 169 wherein said flowable material is injected into said cancellous bone of said vertebral body adjacent said plurality of elements and allowed to harden therein to further stabilize said distracted superior and inferior endplates.

171. (previously added) The method of claim 170 wherein said plurality of elements define a substantially solid structure and said flowable material interdigitates with cancellous bone adjacent such solid structure and at least partially therearound.

172. (previously added) The method of claim 170 wherein said plurality of elements define a permeable structure with one or more openings communicating with said cancellous bone and wherein said flowable material interdigitates with said cancellous bone and resides in said openings of said permeable structure.

173. (previously added) The method of claim 165 wherein said flowable material is injected into said cancellous bone in a step separate from the step of expanding said expendable member.

174. (previously added) A method of treating a damaged or diseased bone having reduced spacing between opposing tissue surfaces as a result of damage or tissue, comprising the steps of:

accessing the interior of said bone;

introducing into the interior of said bone an expandable support member configured to be expanded within the interior of said bone;

expanding said expandable support unidirectionally within said bone to substantially restore the spacing between opposing tissue surfaces of said bone; and

permanently retaining said expandable support in said restored spacing within said bone in said expanded condition.

175. (previously added) The method claim 174 wherein said expandable support member comprises a plurality of elements configured to be consecutively introduced into cooperative contact with each other increasing the dimension of said spacing in one direction.

176. (previously added) The method of claim 175 wherein said elements are wafers adapted to be stacked one wafer atop another wafer to define a stack of wafers in said one direction.

177. (previously added) The method of claim 174 wherein said damaged or diseased bone is a vertebral body in a spine, said vertebral body having superior and inferior endplates spaced apart at a height less than the natural height as a result of said damage or disease, said expandable support being expanded to distract said superior and inferior endplates until the normal height of said vertebral body is substantially attained.

178. (previously added) The method of claim 174 wherein said damaged or diseased bone is a tibia and wherein said expandable support is inserted under the articular surface of the tibial condyle to reduce tibial plateau compression fractures.

179. (new) An apparatus for distracting body tissue, comprising:
an expandable implant comprising a lower member and an upper member, said lower member and said upper member being movably separable and configured for disposition between body tissue to be distracted;
an inserter releasably connected to said expandable implant; and
a plurality of elements, each configured to be consecutively delivered by said inserter between said lower member and said upper member and to cause separation of said lower member and said upper member upon receipt therebetween.

180. (new) The apparatus of claim 179, wherein said elements are each substantially the same size.

181. (new) The apparatus of claim 179, wherein the size of said lower member is greater than the size of said elements.

182. (new) The apparatus of claim 181, wherein the size of said upper member is greater than the size of said elements.

183. (new) The apparatus of claim 179, wherein said inserter is releasably connected to said lower member.

184. (new) The apparatus of claim 179, wherein each said element is a substantially flat plate member configured to be slidably received one atop the other.

185. (new) The apparatus of claim 184, wherein said upper member, said lower member and said plate members are key for interlocking coupling.

186. (new) The apparatus of claim 179, wherein said inserter includes a movable plunger operable to move said elements from said inserter to said implant.

187. (new) The apparatus of claim 186, wherein said inserter further includes a mechanism for feeding wafers between said plunger and said implant.

188. (new) The apparatus of claim 179, wherein said body tissue to be distracted is defined by superior and inferior surfaces of a damaged or diseased vertebral body in a spine, wherein said upper member and said lower member are configured for receipt into said vertebral body and upon receipt of said elements to form a structure between said superior and inferior surfaces of said vertebral body.

189. (new) The apparatus of claim 179, wherein said body tissue to be distracted is defined by superior and inferior endplates of opposing vertebral bodies in a spine, wherein said upper member and said lower member are configured for receipt between said vertebral bodies and upon receipt of said elements to form a structure between said superior and inferior endplates of said opposing vertebral bodies.

190. (new) The apparatus of claim 179, wherein said body tissue to be distracted is defined by surfaces of a damaged or fractured tibia, wherein said upper member and said lower member are configured for receipt between said surfaces and upon receipt of said elements to form a structure between said surfaces.

191. (new) An apparatus for sequentially inserting wafers, stackable consecutively one upon another to form a stack extending in a given direction into a body tissue space to be distracted, the apparatus comprising:

an inserter configured to sequentially advance wafers from a source of wafers into the space to be distracted, said inserter having a distal end for extending into said body tissue space;

a first wafer supported by said inserter at said distal end, said first wafer defining a support surface for supporting subsequent wafers received from said inserter; and

a connection mechanism releasably connecting said first wafer to said inserter.

192. (new) The apparatus of claim 191, wherein said first wafer is of size greater than the size of subsequently received wafers.

193. (new) The apparatus of claim 192, wherein said inserter supports said source of wafers.

194. (new) The apparatus of claim 191, wherein said connection mechanism is capable of supporting forces generated during the consecutive stacking of wafers and to cause separation of said first wafer from said inserter upon movement of said inserter away from said stack of wafers once formed in said body tissue.

195. (new) The apparatus of claim 194, wherein said connection mechanism comprises a releasable press fit between said first wafer and said inserter.

196. (new) The apparatus of claim 194, wherein said connection mechanism comprises a breakable adhesive bond between said first wafer and said inserter.

197. (new) The apparatus of claim 194, wherein said connection mechanism comprises a releasable mechanical coupling between said first wafer and said inserter.

198. (new) The apparatus of claim 191, wherein said first wafer is substantially flat.

199. (new) The apparatus of claim 191, wherein said first wafer is curved in a plane generally normal to said given direction.

200. (new) The apparatus of claim 199, wherein said inserter comprises a guide track for inserting said first wafer into said body tissue space, said guide track being curved in the same plane as said first wafer.